# PRK AND AIR FORCE AVIATION

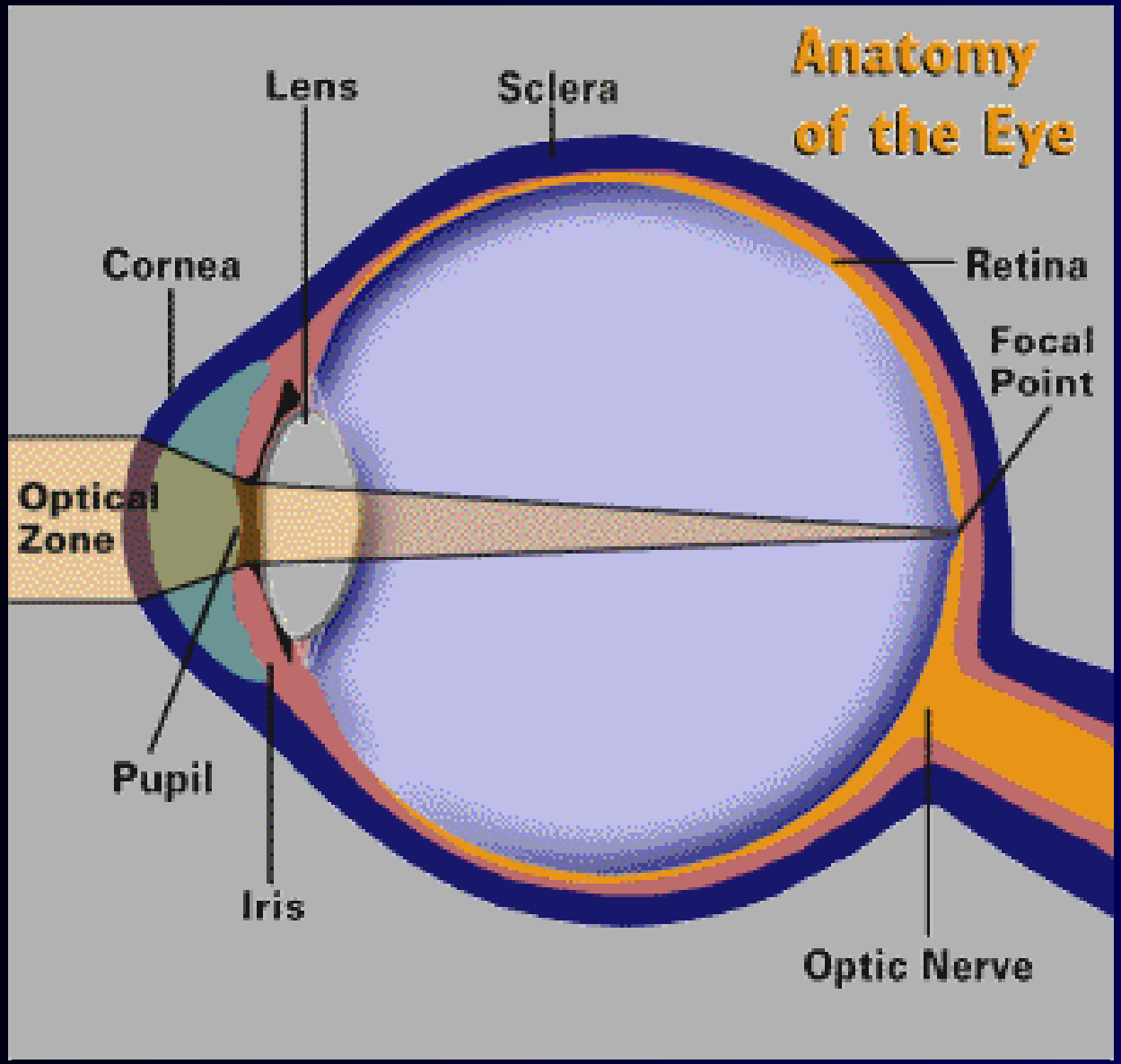
# Aviation & Special Duty PRK

- Corneal Refractive Surgery
  - New AF policy
    - Waiver criteria
      - Trained A/SD personnel
        - Applicants to A/SD career fields

# Corneal Refractive Surgery

- Eye anatomy
  - Optics of the eye
    - Types of Corneal Refractive Surgery (CRS)
      - CRS complications

# Eye Anatomy


Anatomy of the Eye
Lens
Sclera
Cornea
Retina
Focal Point
Optical Zone
Pupil
Iris
Optic Nerve

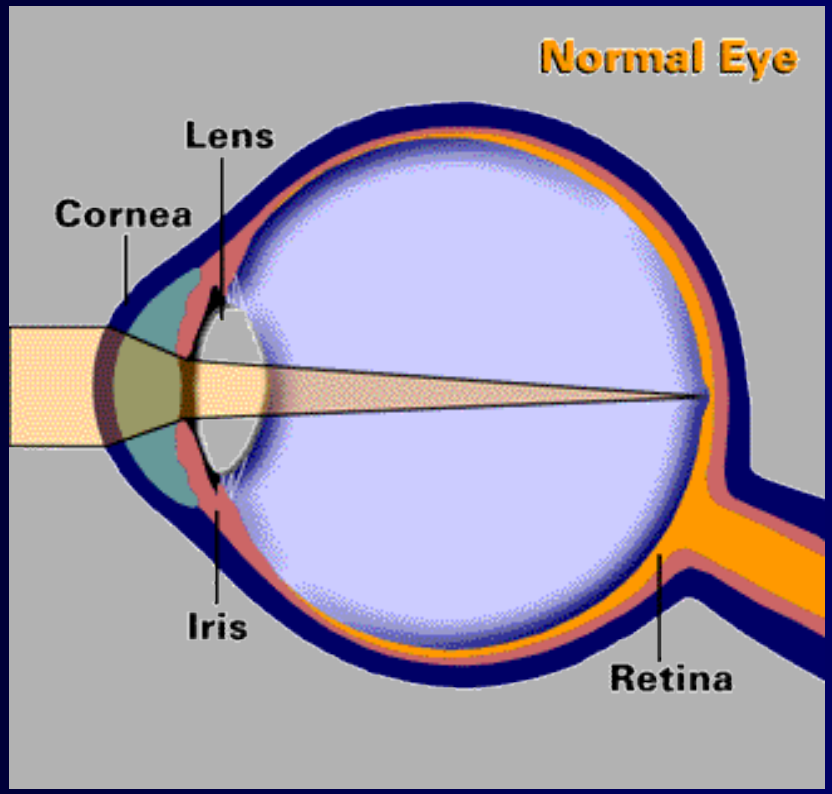
# Optics of the Eye

Optically, the human eye is a “day VFR” system; vision is not as well-adapted to night as it is to day

Focusing power of eye is dependent upon the cornea, the lens and the effects of pupil size

Emmetrope = a naturally 20/20 eye; light rays focus sharply on the retina

All CRS  procedures reshape the cornea to change the focusing power of the eye

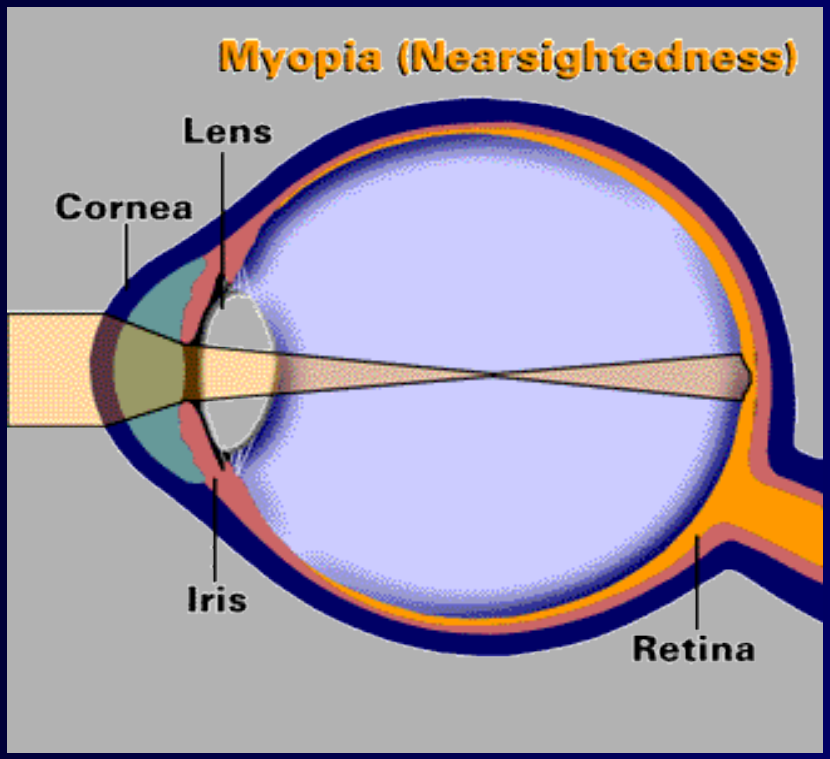


# Optics of the Eye - Myope

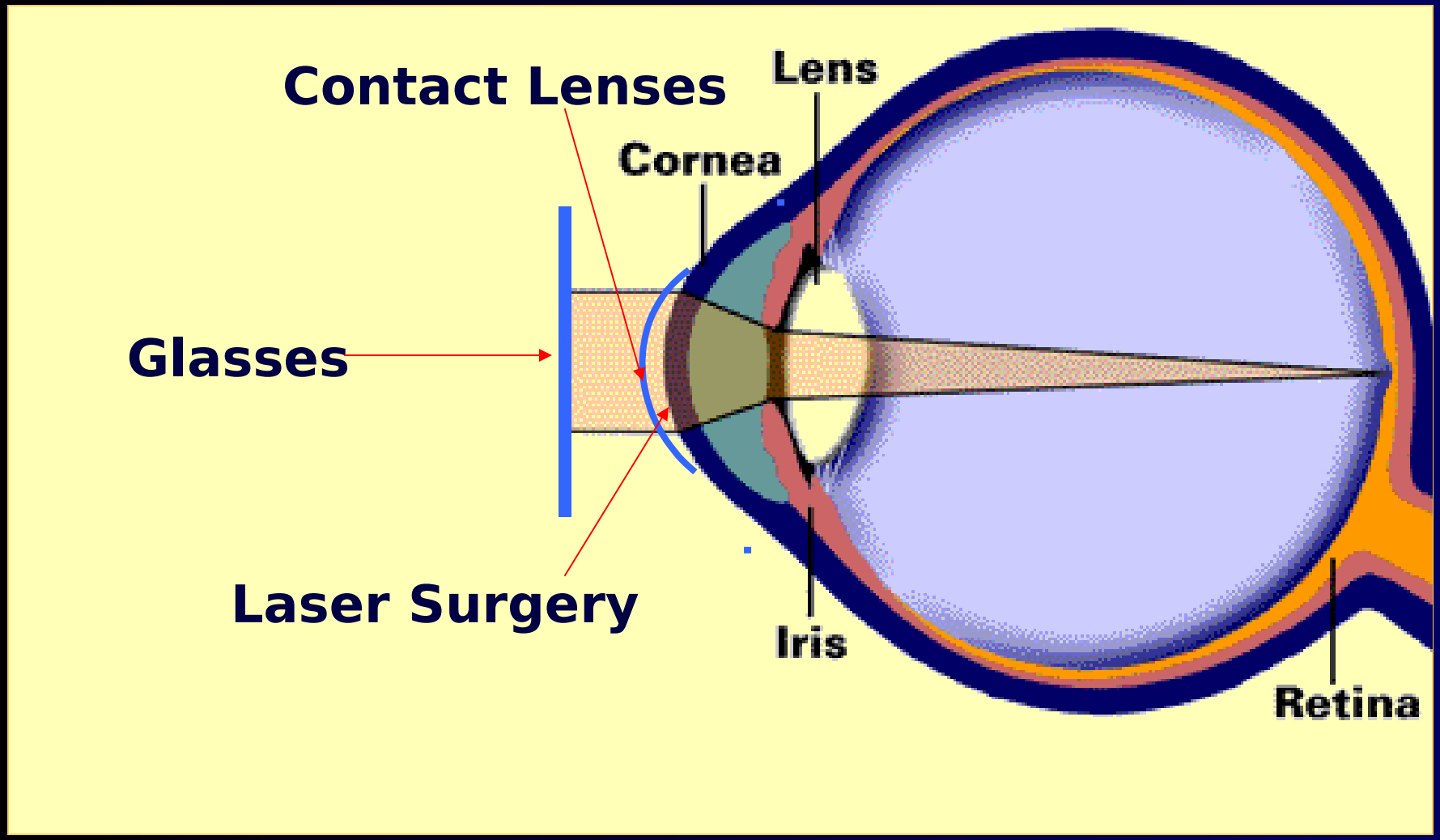
Myopia (nearsighted) = difficulty with unaided distance vision; vast majority of corneal refractive surgical procedures are done for myopia

Near-sighted eye focuses the image in front of the retina

CRS for myopia flattens the cornea, changing its focusing power and allowing the image to focus on (or closer to) the retina



# Changing the Focus Power



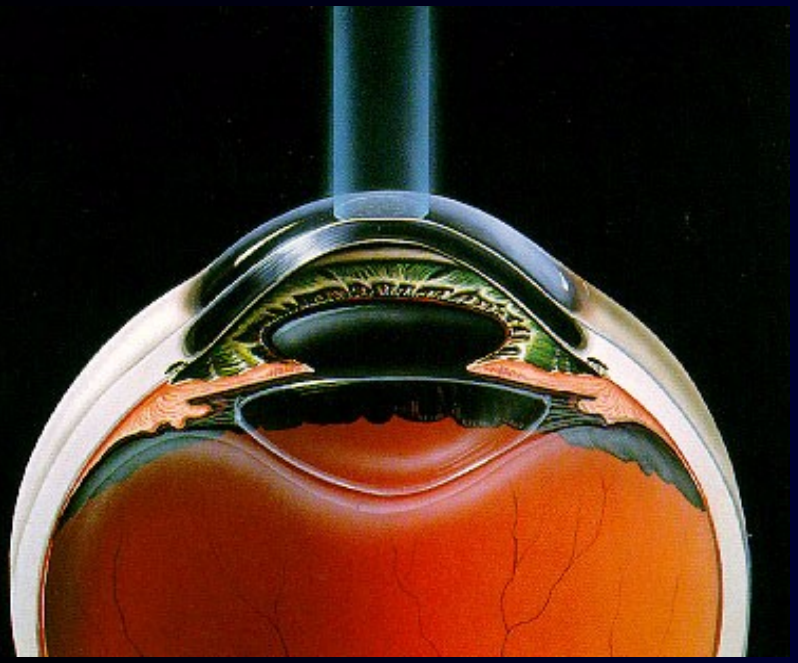
# Corneal Refractive Surgery

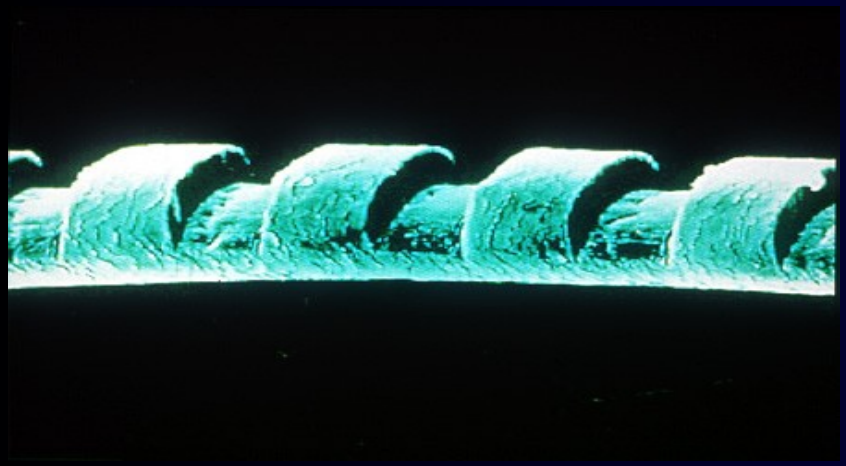
- All CRS acts by changing the shape of the cornea in an attempt to change the focusing power of the eye

- Types of CRS
  - PRK
  - LASIK
  - Other*: Intrastromal Corneal Rings, Radial Keratotomy, intraocular contact lens

**these are disqualifying for accession as well as for A/SD and will not be discussed here*

# What Is PRK?





Photorefractive Keratectomy (PRK) = excimer laser sculpts front of cornea to change its lens power

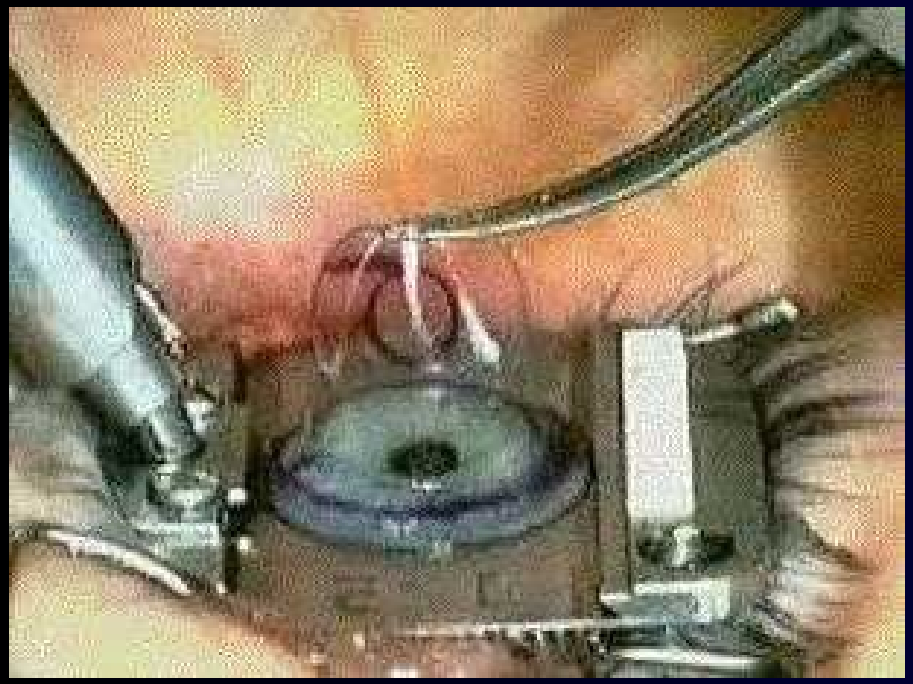
Pros

- 75-80% no longer require glasses for 20/20 distance vision
- No risk of flap instability or potential retinal damage as seen in LASIK

Cons

- 20-25% still require glasses for 20/20

# What is LASIK?



Laser in-situ keratomileusis (LASIK)

- apply suction to eye, slice a flap then sculpt with laser
- PERMANENT DQ for A/SD

Pros

- 75-80% no longer require glasses
- Nearly painfree
- See well immediately

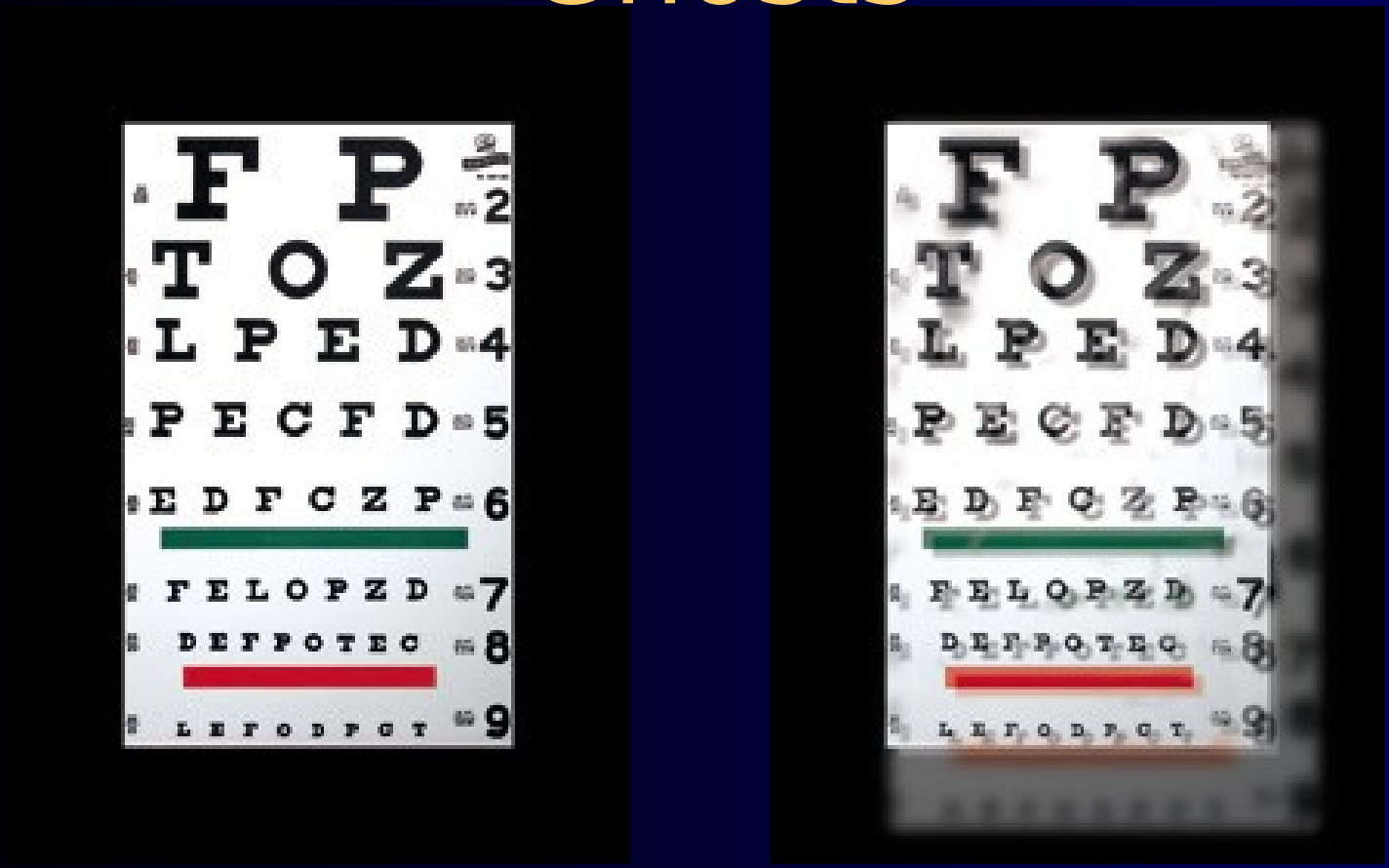
Cons

- 20-25% still require glasses
- Risks as in PRK plus unknown risks related to flap & suction
- Flap dislocation

# CRS Complications

- Complications infrequent but can happen
  - Over-correction/under-correction: 6 – 10%
  - Night vision difficulty: 1 – 4%
  - Glare, halos, double vision, light sensitivity
  - Possible decrease in night vision and in ability to detect camouflaged targets
- Some complications could DQ for A/SD - estimate up to 1%
- You can have 20/20 vision and still not have good quality vision (examples follow)

# CRS Complication: “Ghosts”




Before

After

*You can have 20/20 vision and still not have good <u>quality</u> v*

# CRS Complication: “Halos”

Before

After

*You can have 20/20 vision and still not have good quality*

# New AF Policy

- Effective 2 Aug 00 (HQ USAF/SG memo)
  - By direction of AF Chief of Staff
  - Covers all aviation and special duty personnel (A/SD) and applicants to those career fields
- A/SD means you require an AF Form 1042 for duty
- Strict clinical criteria before and after PRK
- Strict follow-up required (surveillance)

# New AF Policy

- PRK waiver for trained A/SD personnel
  - Limited to 200 trained pilots per year, apportioned by Rated Years of Service
  - No limit on numbers of non-pilot aviation and special duty personnel
- PRK waiver for applicants to A/SD career fields
  - Limited to 10% of UPT selectees from each pilot accession source (total ~100 / year)
  - No limit on numbers of selectees for training in non-pilot A/SD career fields

# Waiver Criteria

- Only for nearsightedness +/- astigmatism
- Refractive error: – 1.00 to – 5.50 diopters (in any meridian)
- Astigmatism: maximum of 3.00 diopters
- Anisometropia: maximum of 3.50 diopters
- Other clinical criteria
- Must meet relevant vision standard post-op

# Trained A/SD Personnel

- Sq/CC permission required; TDYs for treatment and follow-up are unit-funded
- All must sign PRK Briefing Acknowledgment (AD and Reserve Component)
- All must have same initial local screening followed by review and “permission to proceed” from PRK Registry (AD and Reserve Component)

# Trained A/SD Personnel

- AD must have PRK at approved DoD site (mandatory for pilots to be done at WHMC)
- AD A/SD personnel may not obtain PRK at own expense
- Reserve Component personnel must obtain PRK at own expense (including pilots)
  - Not eligible for elective surgery/care in MHS

# Trained A/SD Personnel

- All must comply with the required follow-up evaluations (AD and Reserve Component)
- Time TDY for treatment: 10 - 14 days
- Time DNIF: 6 - 8 weeks
- Time restricted to no-mobility: 4 months (while on steroid eye drops)

# PRK Briefing Acknowledgment:

## Trained A/SD Personnel

- Completed at time of Flight Surgeon visit
- Signed by you and the Flight Surgeon
- Copy maintained in medical record
- Applies to AD and Reserve Component

# PRK Briefing Acknowledgment:

## Trained A/SD Personnel

- Only PRK authorized
- LASIK DQ
- Elective
- Possible MEB or LOD determination
- Possible DQ for continued A/SD
- Mandatory follow-ups
- Automatic DNIF for failure to comply with follow-ups
- Initial operational restrictions for pilots when first resume flying
- PRK doesn’t guarantee waiver for UPT
- PRK waiver does not guarantee selection for UPT (limited slots)

# Process for A/SD Personnel

- Squadron CC permission (documented on application)
  - Clinical screening/application completed by FS and eye doc; PRK briefing acknowledgment
    - Application reviewed by PRK Registry in San Antonio - Permission to Proceed granted if meet selection criteria (pilot slots will be apportioned by Registry on first-come, first-served basis)
      - Schedule appointment - get treated (est. 10 - 14 days TDY for treatment)

# Process for A/SD Personnel

- DNIF for treatment and healing time (est. 6 - 8 weeks); no mobility while on steroid eye drops (est. 4 months)
  - Return to Status locally pending MAJCOM review and certification of waiver (meet applicable vision standard on 2 separate exams minimum of 2 weeks apart)
    - Waiver granted by MAJCOM
      - Mandatory PRK follow-up exams: 1-2-3-4-6 months, 12 months, 24 months

# Process for A/SD Personnel

- 12 & 24 month follow-up exams for pilots and boomers must be done at the PRK Registry in San Antonio
  - All other mandatory follow-ups may be done locally if the eye doc is certified to perform PRK follow-up care
    - Operational restrictions on pilots following PRK:
      - First day and night flight with IP
      - First night formation flight with IP
      - First night refueling flight with IP
      - First NVG flight with IP
      - Documentation of successful performance (copy in medical record and copy to PRK Registry)

# Applicants to A/SD Career Fields

- Must have PRK before applying for waiver
- Must obtain PRK at own expense
  - Applies to all ROTC, USAFA, Reserve Component and civilian applicants
  - Some AD may be qualified for PRK at AF-expense in the near future*
- AD and Reserve Component personnel must sign PRK Briefing Acknowledgment

**program under development and will not be discussed here*

# PRK Briefing Acknowledgment:

## For AD and Reserve Component Personnel Applying to A/SD Career Fields

- Only PRK authorized
- LASIK DQ
- Elective
- Possible MEB or LOD Determination
- Mandatory follow-ups
- PRK doesn’t guarantee waiver (for UPT or any other A/SD field)
- PRK waiver does not guarantee selection for UPT (limited slots)

# Process for Applicants to A/SD

- AD and Reserve Component personnel must sign PRK Briefing Acknowledgment
  - PRK done before applying for the career field
    - PRK waiver accomplished at time of initial flying training physical exam
      - Must provide all required documentation
      - For UPT applicants may apply for waiver as soon as three months after PRK; all others must be at least 12 months after PRK for waiver
      - HQ AETC/SGPS is review and certification authority

# Process for Applicants to A/SD

- Those granted UPT PRK waiver may not begin flying portion of UPT until 12 months after PRK
  - UPT candidates will undergo initial PRK Registry evaluation during Medical Flight Screening en route to UPT base (this will satisfy the “12 month” mandatory follow-up)
    - UPT graduates will undergo second PRK Registry evaluation after graduation and before report to follow-on training base (this will satisfy the “24 month” mandatory follow-up)

# Important Note for UPT/UNT Applicants

- Sep 99 CSAF delegated to SG the authority to waiver UPT & UNT vision standard up to defined
- SG waiver limits (cycloplegic refraction):
  - UPT -3.00 diopters in any meridian
  - UNT -4.50 diopters in any meridian

# QUESTIONS

# Navy Aviation Policy

- Allows PRK in aviators only under two specific research studies
- Retention of Naval Aviator Study (Spring 2000)
  - 3 year study
  - 150 pilots, 250 NFO/WSO, 100 others (FS, enlisted, etc)
- Accession of Naval Aviator Study (just received final approval)
  - 4 year study
  - 250 SNAs (student pilots) and 250 SNFOs (student navs)

# Army Aviation Policy

- Does not allow CRS in any aviation personnel (a/o 10/00)
  - Some concerns with NVG performance after PRK
  - Current research should allay concerns
- Has started research on LASIK in special ops
  - Have done LASIK on 20 Rangers to date

# Current Military Refractive Surgery Research

- Several ongoing studies in all three Services
  - PRK: altitude (chamber and Pikes Peak), acceleration, cockpit vision simulator, night driving simulator, low contrast vision, night vision goggle performance
  - LASIK: flap stability under wind/water blast (animal model), altitude (chamber and Pikes Peak), Rangers, other vision as for PRK

- Inter-service cooperation
  - Joint studies and assistance to each other's studies
  - Share data
  - Share training